

**REMARKS:**

Claims 1 and 4 are amended, and claims 3, 5, 7, and 8 are pending. Claims 2 and 6 have been canceled without prejudice or disclaimer. The applicants respectfully request reconsideration and allowance of this application in view of the above amendments and the following remarks.

Claims 1, 3-5, 7 and 8 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,140,555 to Garcia *et al.* (hereinafter: "Garcia"). The applicants respectfully request that this rejection be withdrawn for the following reasons.

Garcia is directed to nickel-based superalloys that can be cast into castings having improved tensile strength and ductability in thick sections and a fine grain in thick as well as thin sections. A variety of metals are disclosed in formulations of the alloys. One metal, magnesium, is used as a deoxidizer (col. 2, lines 63-64) and "there must be at least 0.022% retained magnesium in the melt when cast." (col. 3, lines 12-15)

In general, it was asserted that the claimed invention is an obvious variant of the disclosure of Garcia when comparing the claimed alloys to those of Garcia using the charts on pages 3, for claim 1, and 5, for claim 4, of the Official action. The examiner noted that it would have been obvious to select the desired amounts, i.e., the amounts recited in the claims, from the amounts disclosed in Garcia, because Garcia and the present invention are directed to the same utility, heat resistant nickel-based alloys. The applicants assert that the claimed invention is not an obvious variant of Garcia for the reasons that follow.

The examiner cited the use of the phrase "up to" in the claims with regard to silicon and manganese and disregarded the existence or importance of these elements when comparing the

present invention to Garcia. Claims 1 and 4, the only independent claims have been amended to recite that the claimed alloy consists of, by weight, 0.06-1.0% Si and 0.04-1.0% Mn. As described in paragraphs [0017] and [0019] of the Patent Application Publication of the claimed invention, Silicon and Manganese are used as deoxidizing agents. Support for these amendments can be found in Table 1 at working examples 1 and 5.

Garcia does not disclose the use of Si and Mn as deoxidizing agents. As illustrated in the tables provided in the office action, the formulations of Garcia do not include any Mn or Si. In Garcia, Magnesium is used as a deoxidizer. An alternative to Magnesium is Calcium. (col. 2, lines 38-51) There is no disclosure or suggestion of using Si or Mn as the deoxidizer agents. In fact, Garcia expressly states that Magnesium or Calcium must be retained in the alloy at the prescribed levels to obtain the desired properties in the casting. Specifically with regard to Magnesium, Garcia states that there must be at least 0.022% in the melt.

Therefore, one of ordinary skill in the art given the disclosure of Garcia would not be taught to use Si and Mn as deoxidizing agents. Instead, Magnesium and Calcium would be taught as the necessary constituents. Given that Garcia expressly states that the alloy must contain a given amount of Magnesium, Garcia teaches one of skill in the art not to modify the disclosed alloy formulations by eliminating Magnesium or modifying the amount of Magnesium. This is reinforced in Garcia by the disclosure that alloy formulations of Garcia containing the prescribed Mg levels produced a tensile ultimate average substantially 17,000 psi higher than that of the average of alloys without the specified Mg levels coupled with a greater than 60% increase in elongation. (col. 4, lines 1-5) Therefore, there is no motivation or suggestion in Garcia to modify or eliminate Mg as an oxidizing agent and to add Si and Mn as deoxidizing

agents. In fact, Garcia teaches away from the need to add Si and Mn as deoxidizing agents as the prescribed levels of the oxidizer agent Mg produce the desired improved properties of the alloy.

In addition, claims 1 and 4 utilize the transitional phrase “consists of”. This term is interpreted to exclude any element, step or ingredient not specified in the claim. Claim 1 does not recite Magnesium. In claim 4, Magnesium is recited up to 0.01%. Neither claim 1 nor claim 4 recites Calcium. The formulations of Garcia, however, must include Magnesium or Calcium to achieve the desired properties in the casting. Removing these ingredients from Garcia would cause the disclosed alloys to be unsuitable for their intended purposes. In addition, Garcia discloses the Magnesium must be present in at least 0.022%. This amount exceeds the 0.01% recited in claim 4. Therefore, Garcia fails to disclose, teach or suggest an alloy that consists of the constituents of the claimed invention.

All of the other claims depend either directly or indirectly from claims 1 and 4 and are patentable over Garcia at least for the same reasons given above with regard to claims 1 and 4. Applicants assert, therefore, the present rejection over Garcia has been overcome and respectfully request that this rejection be reconsidered and withdrawn.

In view of the foregoing, the applicants submit that this application is in condition for allowance. A timely notice to that effect is respectfully requested. If questions relating to patentability remain, the examiner is invited to contact the undersigned by telephone.

A Petition for a three-month Extension of Time Under 37 CFR 1.136(a) and associated fee are submitted concurrently herewith. The Director is hereby authorized to charge any additional fees which may be required, or credit any overpayment, to Deposit Account 50-1147.

Respectfully submitted,  
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